



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2017-0020; Product Identifier 2016-NE-33-AD; Amendment 39-19209; AD 2018-04-13]

RIN 2120-AA64

Airworthiness Directives; Honeywell International Inc. Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Honeywell International Inc. AS907 series turbofan engines. This AD was prompted by seven loss-of-thrust-control events attributed to water intrusion of the engine electronic control unit (ECU). This AD requires applying sealant to identified areas of the ECU and requires inserting a copy of certain airplane operating procedures into the applicable flight manuals. We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Honeywell International Inc., 111 S. 34th Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Internet: <https://myaerospace.honeywell.com/wps/portal/!ut/>. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA,

call 781-238-7759. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0020.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0020; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for Docket Operations (phone: 800-647-5527) is Document Operations, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Joseph Costa, Aerospace Engineer, Los Angeles ACO Branch, FAA, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Honeywell International Inc. AS907 series turbofan engines. The NPRM published in the Federal Register on August 2, 2017 (82 FR 35914). The NPRM was prompted by seven loss-of-thrust-control events attributed to water intrusion of the engine ECU with one event having two in-flight shutdowns (IFSDs) during the same flight. All loss-of-thrust-control events occurred with engines within three years in service. The NPRM proposed to require applying sealant to identified areas of the ECU and to require inserting a copy of certain airplane operating procedures into the applicable flight manuals. We are issuing this AD to address the unsafe condition on these products.

Comments

We gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Change Differences Between this proposed AD and the Service

Information

Honeywell requested changing the recommended compliance time stated in the "Differences Between This Proposed AD and the Service Information" paragraph. Honeywell stated the compliance time started with the issuance of its initial Service Bulletin (SB) AS907-76-9021, Revision 0, dated May 13, 2016.

We partially agree. We agree it would have been appropriate to reference the correct compliance time in this discussion within the NPRM. We do not agree to revise this final rule because this discussion does not exist in the final rule. Further explanation in this final rule is not necessary. We did not change this AD.

Request to Remove Interim Action

Honeywell requested that we remove interim action from this AD. Honeywell reasoned that the redesigned ECU, which is equivalent to an ECU sealed with external sealant, is outside the scope of this AD.

We agree since Honeywell does not plan to retrofit or repair older ECUs. The older ECUs will be sealed with external sealant for the life of the ECU. We removed the Interim Action paragraph from this AD.

Request to Revise Number of Affected Engines

Honeywell requested that the number of engines affected be changed. Honeywell stated the current number of affected engines worldwide is 680 engines installed in airplanes.

We partially agree. We agree with Honeywell's current accounting of 680 affected engines worldwide. We disagree with changing the number of affected engines in this AD because our requirement is to estimate the number of engines installed on U.S. airplanes. Therefore, we are maintaining the estimate made in the NPRM that 477 engines are installed on airplanes in the U.S. Registry.

Request to Clarify Applicability

Honeywell requested that we remove references to ECU Mod Record numbers from this AD. Honeywell reasoned that the affected ECUs Mod Record numbers are only advanced for production sealed ECUs; therefore, ECU Mod Record numbers are not a consistent indication of ECU sealing service bulletin compliance.

We agree. Mod Record numbers are not a good indicator of ECU sealing. We revised the applicability of this AD to refer to the engine model, serial numbers, and listed ECU part numbers (P/Ns) that are not sealed in the areas identified in Figures 1 through 13 of Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017. This change revises the method for operators to determine applicability but does not expand the scope of this AD since the affected populations of ECUs are the same in this final rule as in the NPRM.

Request to Change the Unsafe Condition

Honeywell requested we revise the unsafe condition statement with updated field event information.

We agree because the unsafe condition in paragraph (e) of the NPRM did not include four prior similar loss-of-thrust-control field events noted in the Discussion section. We changed the unsafe condition paragraph to refer to seven low-time loss-of-thrust control events attributed to water intrusion of the engine ECU.

Request to Add Inspection for Application of Sealant

Honeywell requested that we revise the compliance section of this AD by requiring that applicable ECU P/Ns be inspected for application of sealant. The requested change would clarify the method of determining whether ECU sealing had been complied with.

We partially agree. As noted in our response, we have clarified the Applicability section of this AD to refer only to affected ECUs that are not sealed in the areas identified in Figures 1 through 13 of Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017. We therefore, do not need to add an inspection for the application of sealant to the compliance section of this AD.

Request to Eliminate Re-Application of ECU Sealant

Honeywell requested that we remove references to re-application of ECU sealant from this final rule. Honeywell commented that this step will be accomplished through its continued airworthiness documents.

We agree that normal maintenance instructions make it unnecessary to re-apply the ECU sealant. We revised this final rule by removing the references to re-application of the ECU sealant.

Request to Change Compliance

NetJets questioned whether paragraphs (g)(4), (g)(5), and (g)(6) were intended to be subparagraphs of paragraph (g)(3). They justified the request by saying that the crew should only be alerted to Cyan warning per the AFM (Airplane Flight Manual) Emergency Procedures.

We agree. We redesignated paragraphs (g)(4), (g)(5), and (g)(6) in the NPRM as paragraphs (g)(2)(i), (g)(2)(ii), and (g)(2)(iii) in this AD to clarify the intent of the Cyan warning.

Request to Change Credit for Previous Actions

NetJets requested that Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017, be added to the Credit for Previous Actions paragraph. They indicated that an AMOC (alternative method of compliance) might be needed to take credit for this previous action if Revision 1 of the SB was complied with prior to the effective date of the AD.

We disagree because paragraph (f) already states that compliance is necessary unless already done. We did not change this AD.

Revision to Installation Prohibition

We revised the Installation Prohibition, paragraph (h) of this AD, to reflect changes to the applicability and to paragraph designations discussed previously.

Miscellaneous Comments

An individual commenter asked who is responsible for the enforcement of this final rule.

The FAA, Flight Standards Division, is responsible for enforcing regulatory violations arising from noncompliance with ADs. We did not change this AD.

An individual commenter suggested that the FAA is not taking into account the costs associated with improving the standards of the turbofan engines.

We have taken into account the costs associated with this rulemaking as indicated within the Costs of Compliance section of the NPRM. We did not change this AD.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Related Service Information under 1 CFR part 51

We reviewed Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017. The SB describes procedures for applying sealant to identified areas of the ECU to prevent water from entering the ECU on AS907 series engines. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Other Related Information

We also reviewed Honeywell Operating Information Letter (OIL) OIAS907-0001R00, dated March 14, 2017. The OIL provides instructions for interrogating the onboard Maintenance Data Computer to clear engine electronic fault conditions.

Costs of Compliance

We estimate that this ECU sealing affects 477 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated costs				
Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inserting copy of Figure 1, into the AFM	2 work-hours X \$85 per hour = \$170	\$0	\$170	\$81,090
Application of sealant for ECUs in	5.5 work-hours X \$85 per hour = \$467.50	\$50	\$517.50	\$246,847.50

airplane

We estimate the following costs to do a visual inspection of the ECUs. We estimate that 20 engines will need this inspection.

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Fault Check of Maintenance Data Computer	5 work-hours X \$85 per hour = \$425	\$0	\$425

According to the manufacturer, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected individuals. We do not control warranty coverage for affected individuals. As a result, we have included all costs in our cost estimate.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance

and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2018-04-13 Honeywell International Inc.: Amendment 39-19209; Docket No. FAA-2017-0020; Product Identifier 2016-NE-33-AD.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Honeywell International Inc. AS907-1-1A model turbofan engines with engine electronic control unit (ECU), part numbers (P/Ns) 2119576-1001 through -1011, installed; AS907-2-1A model turbofan engines with ECU, P/N 2119576-1102, installed; AS907-2-1G model turbofan engines with ECU, P/Ns 2119576-3002 and -3102, installed; and AS907-3-1E model turbofan engines with ECU, P/Ns 2119576-4102 and -4103, installed with applicable engine serial numbers (S/Ns) in Table 3 of Honeywell Service Bulletin (SB) AS907-76-9021, Revision 1, dated April 20, 2017 that are not sealed in the areas identified in Figures 1 through 13 of Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017.

(d) Subject

Joint Aircraft System Component (JASC) Code 7600, Engine Controls Section.

(e) Unsafe Condition

This AD was prompted by seven low-time loss-of-thrust-control events attributed to water intrusion of the engine ECU. We are issuing this AD to prevent a dual engine

power loss. The unsafe condition, if not addressed, could result in loss of thrust control, damage to the engine, and damage to the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For applicable engines and ECUs, within 200 hours time in service, or 9 months after the effective date of this AD, whichever occurs first, do the following:

(i) If no sealant has been applied to the ECU in the areas identified in Figures 1 through 13 of Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017, apply sealant to the ECU using the Accomplishment Instructions, paragraph 3.C., of Honeywell SB AS907-76-9021, Revision 1, dated April 20, 2017.

(ii) Reserved.

(2) Within 60 days after the effective date of this AD, for all airplanes that have an affected engine installed with an affected ECU not in compliance with paragraph (g)(1) of this AD, insert a copy of Figure 1, 2, or 3 to paragraph (g) of this AD, as applicable to your airplane, into the Emergency Procedures Section of the Airplane Flight Manual (AFM) and perform the following steps as necessary:

(i) If a cyan warning is announced, before next flight, check the current fault messages in the Maintenance Data Computer (MDC)/Onboard Messaging System (OMS) for any of the following:

- (A) FADEC ECU A
- (B) FADEC ECU B
- (C) THROTTLE LEVER 1A
- (D) THROTTLE LEVER 1B
- (E) THROTTLE RIGGING 1A
- (F) THROTTLE RIGGING 1B

(ii) Replace the ECU if any of the fault messages listed in paragraph (g)(2)(i) of this AD are in the MDC OMS. Refer to Honeywell Operating Information Letter OIAS907-0001R00, dated March 14, 2017, for guidance on returning and replacing the ECU.

(iii) Continued flight is permitted if none of the fault messages listed in paragraph (g)(2)(i) of this AD are in the MDC OMS, or if paragraph (g)(2)(ii) of this AD was accomplished.

Figure 1 to Paragraph (g) – Airplane Operating Procedures for Bombardier Airplanes

<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Procedures in dotted line boxes are actions to be performed by the pilot / flight crew.</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px auto; width: 80%;"><p style="text-align: center;"><u>WARNING</u></p><p style="text-align: center;">IF A CYAN “L ENGINE MINOR FAULT” OR “R ENGINE MINOR FAULT” IS ANNOUNCED AT ANY TIME BEFORE TAKEOFF, DO NOT FLY THE AIRPLANE. CONTACT MAINTENANCE PERSONNEL.</p></div>

Figure 2 to Paragraph (g) - Airplane Operating Procedures for Gulfstream Airplanes

<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Procedures in dotted line boxes are actions to be performed by the pilot / flight crew.</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px auto; width: 80%;"><p style="text-align: center;"><u>WARNING</u></p><p style="text-align: center;">IF A CYAN “L ENGINE MINOR FAULT” OR “R ENGINE MINOR FAULT” IS ANNOUNCED AT ANY TIME BEFORE TAKEOFF, DO NOT FLY THE AIRPLANE. CONTACT MAINTENANCE PERSONNEL.</p></div>

Figure 3 to Paragraph (g) – Airplane Operating Procedures for Embraer Airplanes

<p style="text-align: center;">NOTE</p> <p style="text-align: center;">Procedures in dotted line boxes are actions to be performed by the pilot / flight crew.</p> <div style="border: 1px dashed black; padding: 10px; margin: 10px auto; width: 80%;"><p style="text-align: center;"><u>WARNING</u></p><p style="text-align: center;">IF A CYAN “ENGINE SHORT DISPATCH” IS ANNOUNCED AT ANY TIME BEFORE TAKEOFF, DO NOT FLY THE AIRPLANE. CONTACT MAINTENANCE PERSONNEL.</p></div>
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(h) Installation Prohibition

(i) Do not install an ECU if any of the fault messages listed in paragraph (g)(2)(i) of this AD are in the MDC OMS.

(ii) Do not install an ECU that has a P/N listed in paragraph (c) of this AD unless it was sealed as specified in paragraph (g)(1)(i) of this AD.

(i) Terminating Action

Remove from the AFM, Figure 1, 2, or 3 to paragraph (g) of this AD, after paragraph (g)(1)(i) of this AD is accomplished.

(j) Credit for Previous Actions

You may take credit for the actions required by paragraph (g)(1)(i) of this AD, if you performed those actions before the effective date of this AD using Honeywell SB AS907-76-9021, Revision 0, dated May 13, 2016.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Los Angeles ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the

manager of the certification office, send it to the attention of the person identified in paragraph (l) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(l) Related Information

For more information about this AD, contact Joseph Costa, Aerospace Engineer, Los Angeles ACO Branch, FAA, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

(m) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Honeywell Service Bulletin AS907-76-9021, Revision 1, dated April 20, 2017.

(ii) Reserved.

(3) For Honeywell service information identified in this AD, contact Honeywell International Inc., 111 S. 34th Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Internet: <https://myaerospace.honeywell.com/wps/portal!/ut/>.

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the

availability of this material at NARA, call 202-741-6030, or go to:
<http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on February 23, 2018.

Karen M. Grant,
Acting Manager, Engine and Propeller Standards Branch,
Aircraft Certification Service.
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